

## CLAIMS:

1. Method of visualizing a multi-dimensional data set, the method comprising the steps of: performing a segmentation of a structure in the data set; and performing a visualization of the data set; wherein a projection direction of the visualization is determined on the basis of the structure.  
5
2. The method according to claim 1, wherein the visualization is performed on the basis of visualization parameters comprising the projection direction; wherein the visualization parameters are determined on the basis of at least one of the segmentation and a low-level analysis of the data set; and wherein the visualization  
10 parameters are selected from the group consisting of a relative position of the structure, a direction relative to the structure, a distance between the structure and an object of interest, a motion estimation, and a motion compensation.
3. The method according to claim 1, wherein the structure is one of a  
15 biopsy needle and an endoscope probe; wherein a first projection of the data set is performed in a direction of a longitudinal axis of the structure, resulting in a first image with an image surface area perpendicular to the direction of the longitudinal axis; and wherein a second projection of the data set is performed in a direction perpendicular to the longitudinal axis of the structure, resulting in a second image comprising the  
20 structure.
4. The method according to claim 3, wherein at least one of the visualization parameters is displayed during visualization of the data set.
- 25 5. The method according to claim 1, further comprising the step of: varying a rendering method in an image resulting from the visualization of the data set; wherein the variation of the rendering method causes a non-uniform quality of the image.

6. The method according to claim 5, wherein the variation of the rendering method comprises a variation of a sampling rate in the image; and wherein the variation of the rendering method is performed on the basis of the visualization parameters.

5

7. The method according to claim 1, wherein the segmentation is performed on the basis of one of a Hough Transform and a determination of active localizers.

8. The method according to claim 1, wherein the data set is acquired by  
10 means of one of an ultrasound imaging system, a CT imaging system, and an MR imaging system.

9. An image processing device for visualizing a multi-dimensional data set, the image processing device comprising: a memory for storing the data set; an image  
15 processor adapted for performing the following operation: loading the data set; performing a segmentation of a structure in the data set; and performing a visualization of the data set; wherein a projection direction of the visualization is determined on the basis of the structure.

20 10. The image processing device according to claim 9, wherein the structure is a biopsy needle; wherein the visualization is performed on the basis of visualization parameters; wherein the visualization parameters are determined on the basis of at least one of the segmentation and a low-level analysis of the data set; and wherein the visualization parameters are selected from the group consisting of a relative position of  
25 the structure, a direction relative to the structure, a distance between the structure and an object of interest, and a motion estimation, wherein a first projection of the data set is performed in a direction of a longitudinal axis of the biopsy needle, resulting in a first image with an image surface area perpendicular to the direction of the longitudinal axis; and wherein a second projection of the data set is performed in a direction perpendicu-  
30 lar to the longitudinal axis of the biopsy needle, resulting in a second image comprising the biopsy needle.

11. An imaging system, comprising: a memory for storing a multi-dimensional data set; an image processor adapted for performing a visualization of the data set, wherein the image processor is adapted for performing the following operation:  
5 loading the data set; performing a segmentation of a structure in the data set; and performing a visualization of the data set; wherein a projection direction of the visualization is determined on the basis of the structure.
- 10 12. The imaging system according to claim 11, wherein the structure is a biopsy needle; wherein the visualization is performed on the basis of visualization parameters; wherein the visualization parameters are determined on the basis of at least one of the segmentation and a low-level analysis of the data set; and wherein the visualization parameters are selected from the group consisting of a relative position of  
15 the structure, a direction relative to the structure, a distance between the structure and an object of interest, and a motion estimation, wherein a first projection of the data set is performed in a direction of a longitudinal axis of the biopsy needle, resulting in a first image with an image surface area perpendicular to the direction of the longitudinal axis; and wherein a second projection of the data set is performed in a direction perpendicular to the longitudinal axis of the biopsy needle, resulting in a second image comprising  
20 the biopsy needle.
13. The imaging system according to claim 11, wherein the imaging system is one of an MR imaging system, a CT imaging system, and an ultrasound imaging  
25 system.
14. A computer program for performing a visualization of a multi-dimensional data set, wherein the computer program causes an image processor to perform the following operation when the computer program is executed on the image  
30 processor: loading the data set; performing a segmentation of a structure in the data set; and performing a visualization of the data set; wherein a projection direction of the visualization is determined on the basis of the structure.